

REMARKS

I. STATUS OF CLAIMS

Applicant appreciates the Examiner's indication of allowable subject matter of claim 9. Office Action at 4. Applicant has amended claim 2 to incorporate the allowable subject matter of claim 9, and has cancelled claim 9. Written support for the amendment can be found in the as-filed specification, e.g., at page 9, lines 13-22. No new matter has been introduced. Claims 1-8 are pending.

II. RESPONSE TO REJECTIONS

The Office Action set forth the following rejections under 35 U.S.C. § 103(a):

- the rejection of claim 1 based on SU 422262 ("SU '262") in view of U.S. Patent No. 6,204,358 to Tanaka et al. ("Tanaka") (Office Action at 2);
- the rejection of claims 1-8 based on SU ' in view of JP 2002053573 ("JP '573"), and further in view of Tanaka (*Id.* at 2); and
- the rejection of claims 1-8 based on SU ' 262 in view of Kawanami et al., *Research of carbonate synthesis using supercritical carbon dioxide and ionic liquid*, abstract, the 35th Fall Meeting of Society of Chemical Engineers, Japan, September 18-20, 2002 ("Kawanami"), and further in view of Tanaka (*Id.* at 3).

None of these references, alone or in combination, discloses or suggests the cyclic carbonated polymeric compound expressly recited in claim 1. The Office Action, however, maintains the allegation that the combination of the cited references would render obvious a method producing the compound of claim 1. Specifically, the Office Action alleges that Tanaka discloses "[n]atural rubber . . . is known to be superior to synthetic rubber in mechanical properties," and that "removal of non-rubber components from such natural rubber . . . is known to improve mechanical properties and result in more uniform batch to batch properties . . . and reduce allergic skin reactions." Office

Action at 2-4. The Office Action further asserted that "it would have been obvious to utilize a 'deproteinized' natural rubber as the source of SU 422262's polyisoprene for the expected advantages." *Id.*

Applicant previously pointed out that deproteinization of natural rubber prior to an epoxidation step is necessary to produce the claimed cyclic carbonated polymeric compound, and that since such advantageous aspect was not known in the art at the time of the present invention, it would not be obvious to add a "deproteinizing natural rubber" step to the method as taught in SU '262. See Reply to Office Action filed June 22, 2010, pages 9-11.

In response, the Examiner alleged that "Applicant [purportedly] argues it is impossible to epoxidize natural rubber without first deproteinizing the rubber and that such knowledge was not known in the art at the time of applicant's invention." Office Action at 5 (emphasis added). Applicant does not concede to this allegation. In the June 22 Reply, Applicant did not argue that it is impossible to epoxidize natural rubber without first deproteinizing the natural rubber. Applicant argued that when natural rubber containing protein is used as a starting material, the cyclic carbonated polymeric compound of claim 1 would not be produced without first deproteinizing the natural rubber. See *e.g.*, June 22 Reply, page 10, lines 11-13, 18-19.

Further, based on the above-mischaracterization of Applicant's arguments, the Office Action at page 5 further made the following assertions:

- (1) "Applicant's original specification ...[allegedly] states [that] proteins can be present (page 7, line 5);"
- (2) Klinkai et al., *Eur. Polym. J.*, 2003, 39, 1707-1712 ("Klinkai '03") allegedly "shows that natural rubber can be epoxidized without deproteinization;" this article, which identifies authors

that are also listed as inventors of the instant application, allegedly "contradicts [A]pplicant's argument;"

(3) U.S. Patent No. 6,797,783 to Tanaka et al. and its equivalent JP 06329702 ("Tanaka '783") allegedly "show that well before [A]pplicant's invention, it was known in the art that deproteinizing natural rubber can improve epoxidation ratio relative to natural rubber that hasn't been deproteinized, . . . [allegedly] refut[ing] [A]pplicant's [alleged] argument that it is impossible to epoxidize natural rubber without deproteinization;" further, by allegedly teaching that "it is expected . . . that deproteinization would improve the epoxidation step," Tanaka [allegedly] provides additional motivation to deproteinize the polyisoprene if natural rubber is to be the source of the polyisoprene."

Applicant respectfully submits that the above assertions are improper at least in the following aspects.

Regarding the assertion (1), Applicant notes that the Office Action erroneously relied on a portion of the specification disclosing a feature having a scope different from that of the claim. The cited portion of the as-filed specification discloses that "[a mixture mainly composed of a novel cyclic carbonate-containing polymeric compound represented by formula (I)] can additionally comprise very small amounts of other ingredients (e.g., protein)" (emphasis added). Claim 1, on the other hand, limits the scope of the compound to consist of the structure expressly depicted in formula (I), excluding any other monomer units not to mention proteins. The Office Action also acknowledged this feature. See Office Action, page 5, last paragraph.

Regarding the assertion (2), Applicant notes that the publication date of Klinkai '03 predates the foreign priority of the present application, and that Klinkai '03 is listed as a reference in the Klinkai document (published in 2004, hereafter "Klinkai '04") cited in the June 22 Reply. Klinkai '03 thus discloses the knowledge in the art at the time of

the present invention, whereas Klinkai '04 shows information that was not necessarily known at the time of the present invention. Applicant's argument citing the latest knowledge does not necessarily contradict the knowledge in the art at the time of the present invention.

Furthermore, as discussed above, Applicant cited Klinkai '04 to show that it is impossible for epoxy groups contained in an epoxidized natural rubber to interact with a catalyst (a Li salt) unless the natural rubber has been deproteinized, since water associated with proteins interacts with the epoxy groups, and such knowledge was not necessarily known at the time of the present invention. See the June 22 Reply, pages 10-11.

Regarding the assertion (3), Applicant points out that Tanaka '783 does not recognize that a cyclic carbonated polymeric compound as claimed cannot be prepared unless natural rubber is deproteinized prior to epoxidation. Specifically, Tanaka does not teach that deproteinization of natural rubber prior to an epoxidation step is necessary to avoid water associated with proteins interacting with the epoxy groups in an epoxidized natural rubber, and eventually to produce the claimed cyclic carbonated polymeric compound. Instead, Tanaka merely discloses that deproteinizing natural rubber can improve epoxidation ratio relative to natural rubber. Tanaka, col. 2, lines 53-55.

In view of the above reasons and reasons of record in the June 22 Reply, considering the references, it would not have been obvious to one of ordinary skill in the art at the time of the invention to produce the cyclic carbonated polymeric compound of claim 1. M.P.E.P. § 2141.02 (obviousness cannot be predicated on what is not known

at the time an invention is made, even if the inherency of a certain feature is later established).

In addition, amended claim 2 recites, "liquefying the deproteinized natural rubber or the epoxidized deproteinized natural rubber via depolymerization," which the Office Action acknowledges as allowable subject matter.

For at least the foregoing reasons, claims 1-8 are allowable over the cited references.

III. CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application, withdrawal of the rejections, and timely allowance of the pending claims.

Entry of this Reply to Office Action under 37 C.F.R. § 1.116 is proper in order to place the claim in condition for allowance or in better form for appeal. The proposed amendments do not raise new issues or necessitate the undertaking of any additional search of the art by the Examiner, since all of the elements and their relationships should have been previously searched and considered.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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